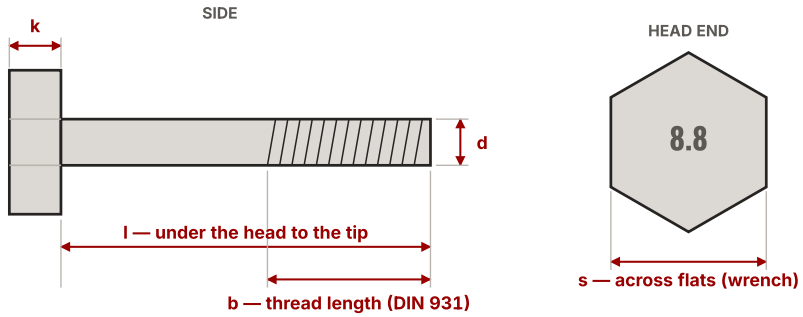
Metric Hex Cap Screw Dimensions

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Across flats (the wrench), head height and thread length for metric hex cap screws M3 to M36 — DIN 933 and DIN 931 — plus tensile stress area.

The numbers behind a **metric hex cap screw**. **DIN 933** is threaded the full length; **DIN 931** has a plain shank and a thread length **b**. The fine-thread versions, **DIN 961** and **DIN 960**, have the same heads. Across flats **s** is your wrench size. Sizes are in millimeters.



Letters match the table columns. **s** across flats (the wrench size), **k** head height, **l** length from under the head, **b** thread length on a DIN 931 screw, **d** thread diameter. Metric heads are marked with their property class (8.8, 10.9, 12.9).

Metric hex cap screws — DIN 933 / DIN 931 (mm)

SIZE	PITCH (COARSE)	ACROSS FLATS S (WRENCH)	S MIN	HEAD HEIGHT K	K MIN / MAX
M3	0.5	5.5 mm	5.32	2 mm	1.88 / 2.12
M4	0.7	7 mm	6.78	2.8 mm	2.68 / 2.92
M5	0.8	8 mm	7.78	3.5 mm	3.35 / 3.65
M6	1	10 mm	9.78	4 mm	3.85 / 4.15
M8	1.25	13 mm	12.73	5.3 mm	5.15 / 5.45
M10	1.5	17 mm	16.73	6.4 mm	6.22 / 6.58
M12	1.75	19 mm	18.67	7.5 mm	7.32 / 7.68
M14	2	22 mm	21.67	8.8 mm	8.62 / 8.98
M16	2	24 mm	23.67	10 mm	9.82 / 10.18
M18	2.5	27 mm	26.67	11.5 mm	11.28 / 11.72
M20	2.5	30 mm	29.67	12.5 mm	12.28 / 12.72
M22	2.5	32 mm	31.61	14 mm	13.78 / 14.22
M24	3	36 mm	35.38	15 mm	14.78 / 15.22
M27	3	41 mm	40	17 mm	16.65 / 17.35
M30	3.5	46 mm	45	18.7 mm	18.28 / 19.12
M33	3.5	50 mm	49	21 mm	20.58 / 21.42
M36	4	55 mm	53.8	22.5 mm	22.08 / 22.92

DIN vs. ISO: ISO 4017 / 4014 heads are the same except across the flats at **M10, M12, M14 and M22** — check which one you have before you grab a wrench. M27 and up are made to product grade B; their minimums are grade B.

Thread length b — DIN 931 (mm)

SIZE	L UP TO 125 MM	L OVER 125, UP TO 200 MM	L OVER 200 MM
M3	12 mm	—	—
M4	14 mm	—	—
M5	16 mm	22 mm	—
M6	18 mm	24 mm	—
M8	22 mm	28 mm	—
M10	26 mm	32 mm	45 mm
M12	30 mm	36 mm	49 mm

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SIZE	L UP TO 125 MM	L OVER 125, UP TO 200 MM	L OVER 200 MM
M14	34 mm	40 mm	53 mm
M16	38 mm	44 mm	57 mm
M18	42 mm	48 mm	61 mm
M20	46 mm	52 mm	65 mm
M22	50 mm	56 mm	69 mm
M24	54 mm	60 mm	73 mm
M27	60 mm	66 mm	79 mm
M30	66 mm	72 mm	85 mm
M33	72 mm	78 mm	91 mm
M36	78 mm	84 mm	97 mm

A DIN 933 screw is threaded all the way to the head instead. When the screw is shorter than the thread length, it is threaded the full length.

Tensile stress area (mm²)

THREAD	SERIES	PITCH (MM)	STRESS AREA
M1	Coarse	0.25	0.5
M1.1	Coarse	0.25	0.6
M1.2	Coarse	0.25	0.7
M1.4	Coarse	0.3	1.0
M1.6	Coarse	0.35	1.3
M1.8	Coarse	0.35	1.7
M2	Coarse	0.4	2.1
M2.2	Coarse	0.45	2.5
M2.5	Coarse	0.45	3.4
M3	Coarse	0.5	5.0
M3.5	Coarse	0.6	6.8
M4	Coarse	0.7	8.8
M5	Coarse	0.8	14.2
M6	Coarse	1	20.1
M7	Coarse	1	28.9
M8	Coarse	1.25	36.6
M9	Coarse	1.25	48.1
M10	Coarse	1.5	58.0
M11	Coarse	1.5	72.3
M12	Coarse	1.75	84.3
M14	Coarse	2	115.4
M16	Coarse	2	156.7
M18	Coarse	2.5	192.5
M20	Coarse	2.5	244.8
M22	Coarse	2.5	303.4
M24	Coarse	3	352.5
M27	Coarse	3	459.4
M30	Coarse	3.5	560.6
M33	Coarse	3.5	693.6
M36	Coarse	4	816.7
M39	Coarse	4	975.8
M42	Coarse	4.5	1120.9
M45	Coarse	4.5	1306.0
M48	Coarse	5	1473.2
M52	Coarse	5	1757.8
M56	Coarse	5.5	2030.0
M1×0.2	Fine	0.2	0.5

THREAD	SERIES	PITCH (MM)	STRESS AREA
M2×0.25	Fine	0.25	2.4
M4×0.35	Fine	0.35	10.6
M4×0.5	Fine	0.5	9.8
M5×0.5	Fine	0.5	16.1
M6×0.5	Fine	0.5	24.0
M6×0.75	Fine	0.75	22.0
M7×0.75	Fine	0.75	31.1
M8×0.5	Fine	0.5	44.5
M8×0.75	Fine	0.75	41.8
M8×1.0	Fine	1	39.2
M9×0.75	Fine	0.75	54.1
M9×1.0	Fine	1	51.0
M10×0.75	Fine	0.75	67.9
M10×1.0	Fine	1	64.5
M10×1.25	Fine	1.25	61.2
M11×0.75	Fine	0.75	83.3
M11×1.0	Fine	1	79.5
M12×1.0	Fine	1	96.1
M12×1.25	Fine	1.25	92.1
M12×1.5	Fine	1.5	88.1
M14×1.0	Fine	1	134.0
M14×1.25	Fine	1.25	129.2
M14×1.5	Fine	1.5	124.5
M15×1.0	Fine	1	155.3
M15×1.5	Fine	1.5	145.1
M16×1.0	Fine	1	178.2
M16×1.5	Fine	1.5	167.2
M17×1.0	Fine	1	202.6
M17×1.5	Fine	1.5	191.0
M18×1.0	Fine	1	228.6
M18×1.5	Fine	1.5	216.2
M18×2.0	Fine	2	204.2
M20×1.0	Fine	1	285.4
M20×1.5	Fine	1.5	271.5
M20×2.0	Fine	2	258.0
M22×1.0	Fine	1	348.4
M22×1.5	Fine	1.5	333.1
M22×2.0	Fine	2	318.1
M24×1.0	Fine	1	417.7
M24×1.5	Fine	1.5	400.9
M24×2.0	Fine	2	384.4
M25×1.0	Fine	1	454.7
M25×1.5	Fine	1.5	437.2
M25×2.0	Fine	2	420.0
M26×1.5	Fine	1.5	475.0
M27×1.0	Fine	1	533.5
M27×1.5	Fine	1.5	514.4
M27×2.0	Fine	2	495.7
M28×1.0	Fine	1	575.2
M28×1.5	Fine	1.5	555.4
M28×2.0	Fine	2	536.0
M30×1.5	Fine	1.5	642.1
M30×2.0	Fine	2	621.2

THREAD	SERIES	PITCH (MM)	STRESS AREA
M33×2.0	Fine	2	760.8
M36×3.0	Fine	3	864.9
M39×3.0	Fine	3	1028.4
M42×3.0	Fine	3	1206.0
M45×3.0	Fine	3	1397.7
M48×3.0	Fine	3	1603.6
M52×4.0	Fine	4	1828.2

The area a screw's strength works over: **load in newtons = stress area × the class's strength in MPa.** Example: an M10 8.8 has 58.0 mm² × 800 MPa = about 46,400 N minimum tensile. Worked out as 0.7854 × (d − 0.9382 × P)² (ISO 898-1), from the metric thread chart.

Metric hex flange bolts — DIN 6921 (mm)

SIZE	WRENCH S	FLANGE DIA DC MAX	HEAD HEIGHT K MAX
M5	8 mm	11.8	6.2
M6	10 mm	14.2	7.3
M8	13 mm	17.9	9.4
M10	15 mm	21.8	11.4
M12	18 mm	26	13.8
M14	21 mm	29.9	15.9
M16	24 mm	34.5	18.3
M20	30 mm	42.8	22.4

A hex head with a built-in washer face (often serrated to resist loosening). Head height k includes the flange. Stress area and class strength are the same as for a hex cap screw of the same thread.

Strength and marking

Metric hex caps are marked on the head with their **property class** — 8.8, 10.9 or 12.9. What each class guarantees is on the ISO 898-1 page. The inch version of this chart is hex cap screw dimensions; not sure if a bolt is metric? See metric vs. inch.

Quick answers

What size wrench fits an M10 bolt?

An M10 hex cap screw (DIN 933 / 931) takes a **17 mm** wrench.

What wrench size goes with each metric bolt size?

Across the flats: M3 – 5.5 mm, M4 – 7 mm, M5 – 8 mm, M6 – 10 mm, M8 – 13 mm, M10 – 17 mm, M12 – 19 mm, M14 – 22 mm, M16 – 24 mm, M18 – 27 mm, M20 – 30 mm, M22 – 32 mm, M24 – 36 mm, M27 – 41 mm, M30 – 46 mm, M33 – 50 mm, M36 – 55 mm (DIN 933 / 931).

What is the thread pitch of an M12 bolt?

M12 coarse thread is **1.75 mm** pitch. Each coarse pitch is in the table above.

How tall is the head of an M8 hex cap screw?

About **5.3 mm** (5.15–5.45 mm).

How long is the thread on a metric hex cap screw?

On a partially threaded screw up to 125 mm long, the thread length is set by size — for example 22 mm on M8 and 26 mm on M10.

Reference values drawn from the governing standards. For critical applications, confirm against the standard and the manufacturer's published data. Technical information disclaimer →